

## THE CLAIMS

- 1    1. (currently amended) A nozzle for an injection molding machine, comprising:
- 2                 a nozzle body having first and second passageways therethrough, a counter bore defining  
3                 an inner wall and a ledge, a portion of said inner wall being threaded, and an annular groove in  
4                 said counter bore ledge, said annular groove being in fluid communication with said nozzle body  
5                 second passageway;
- 6                 an inner nozzle having a first end and having an orifice at a second end, said inner nozzle  
7                 having a passageway therethrough in fluid communication with said nozzle body first  
8                 passageway; and
- 9                 an outer nozzle removably and fixedly coupled to said nozzle body at a first end and  
10                having an orifice at a second end, said outer nozzle having a passageway therethrough in fluid  
11                communication with said nozzle body second passageway, said inner nozzle being positioned  
12                within said outer nozzle passageway.
- 1    2. (canceled)
- 1    3. (currently amended) The nozzle of claim [[2]] 1, wherein said annular groove has a  
2                 hemispherical shape.

- 1    4. (currently amended) The nozzle of claim [[2]] 1, wherein said outer nozzle further  
2    includes:  
  
3                 a wall having a threaded portion to matingly engage said nozzle body inner wall threaded  
4    portion; and  
  
5                 an annular groove on an inner end of said outer nozzle wall positioned to matingly  
6    engage said nozzle body annular groove to provide fluid communication between said nozzle  
7    body second passageway and an inner surface of said outer nozzle wall.  
  
1    5. (original) The nozzle of claim 4, wherein said outer nozzle annular groove has a  
2    hemispherical shape.  
  
1    6. (original) The nozzle of claim 4, wherein:  
2                 said outer nozzle further includes a ledge in said inner surface of said outer nozzle wall;  
3    and  
4                 said inner nozzle further includes a wall having a ledge on an outer surface of said inner  
5    nozzle wall, said inner nozzle ledge configured to matingly engage said outer nozzle ledge.  
  
1    7. (original) The nozzle of claim 6, wherein said inner and outer nozzles are configured  
2    such that when said inner nozzle ledge is matingly engaged with said outer nozzle ledge and said  
3    outer wall threaded portion is matingly engaged with said nozzle body inner wall threaded  
4    portion, said inner nozzle is retained such that said inner nozzle passageway is in fluid  
5    communication with said nozzle body first passageway and said outer nozzle passageway is in  
6    fluid communication with said nozzle body second passageway.

1       8.     (original) The nozzle of claim 7, wherein said nozzle body, said inner nozzle, and said  
2     outer nozzle are all substantially concentric.

1       9.     (original) The nozzle of claim 1, wherein:  
2              said inner nozzle orifice and said outer nozzle orifice are substantially concentric and  
3              substantially coplanar; and  
4              said outer nozzle orifice substantially surrounds said inner nozzle orifice.

1       10.    (original) The nozzle of claim 9, wherein said inner nozzle orifice has a diameter of  
2     approximately 0.020 inch to approximately 0.150 inch.

1       11.    (original) The nozzle of claim 10, wherein said outer nozzle orifice has a diameter of  
2     approximately 0.050 inch to approximately 0.250 inch.

1       12.    (original) The nozzle of claim 1, wherein a ratio of a diameter of said outer nozzle to a  
2     diameter of said inner nozzle is from approximately 1:1 to approximately 10:1.

1       13.    (original) The nozzle of claim 12, wherein said ratio is less than approximately 5:1.

1       14.    (original) The nozzle of claim 12, wherein said ratio is less than approximately 3:1.

1       15.    (original) The nozzle of claim 1, wherein:  
2              said inner nozzle orifice and said outer nozzle orifice are substantially concentric and not  
3              substantially coplanar; and  
4              said outer nozzle orifice substantially surrounds said inner nozzle orifice.

1       16. (original) The nozzle of claim 1, wherein:

2           said inner nozzle further includes a wall having an inner surface and an outer surface;

3           said inner surface defines said inner nozzle passageway; and

4           said outer surface has a plurality of radial grooves, said radial grooves being in fluid

5           communication with said nozzle body second passageway.

1    17. (currently amended) The A nozzle of claim 16 for an injection molding machine,  
2    comprising:  
3        a nozzle body having first and second passageways therethrough;  
4        an inner nozzle having a first end and having an orifice at a second end, said inner nozzle  
5        having a passageway therethrough in fluid communication with said nozzle body first  
6        passageway; and  
7        an outer nozzle removably and fixedly coupled to said nozzle body at a first end and  
8        having an orifice at a second end, said outer nozzle having a passageway therethrough in fluid  
9        communication with said nozzle body second passageway, said inner nozzle being positioned  
10      within said outer nozzle passageway; wherein:  
11        said inner nozzle further includes a wall having an inner surface and an outer surface;  
12        said inner surface defines said inner nozzle passageway;  
13        said outer surface has a plurality of radial grooves, said radial grooves being in fluid  
14      communication with said nozzle body second passageway;  
15        said radial grooves extend from said inner nozzle first end to an alignment diameter of  
16      said inner nozzle;  
17        said inner nozzle further includes an annular groove between said alignment diameter and  
18      said inner nozzle orifice; and  
19        said inner nozzle further includes a plurality of outer passageways providing fluid  
20      communication between said radial grooves and said inner nozzle annular groove.

- 1       18. (original) The nozzle of claim 17, wherein:
- 2              said inner nozzle further includes a tapered section between said inner nozzle annular
- 3          groove and said inner nozzle second end; and
- 4              an end of said tapered section and said outer nozzle defines said outer nozzle orifice, said
- 5          outer nozzle orifice being annular.
- 1       19. (original) The nozzle of claim 18, wherein said inner nozzle further includes a section
- 2          having a substantially uniform diameter between said inner nozzle annular groove and said
- 3          tapered section.
- 1       20-26. (canceled)